TRACE METAL P ARAMETERS

Guidance Document

(revised 9/2004)

The SC DHEC Office of Environmental Laboratory Certification issues approval to in-state laboratories reporting trace metals determinations under the Safe Drinking Water, Clean Water Act, and Solid and Hazardous Waste Programs. Certification is mandated under State Regulation R.61-81. Certification may be extended to out-of-state laboratories based upon documentation of certification under equivalent programs. The Department reserves the right to conduct on-site laboratory evaluations and to require the analysis of performance audit samples as deemed necessary.

Certification is limited to those methods cited and approved by the EPA for regulatory monitoring. The procedural, quality control, and technical guidance contained in these references are considered "minimum requirements" for approval. The approved references are promulgated as "final rules" in the *Federal Register* under the authority of the:

Safe Drinking Water Act: National Primary and Secondary Drinking Water Regulations, (40 CFR Parts 141 and 143): "Analytical Methods for Regulated Drinking Water Contaminants."

Federal Water Pollution Control Act: as amended by the Clean Water Act, (40 CFR Part 136): "Guidelines Establishing Test Procedures for the Analysis of Pollutants."

Resource Conservation and Recovery Act: Hazardous Waste Management System, Testing and Monitoring Activities, (40 CFR Parts 260 through 270). "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 Third Edition as amended by Updates I, II, IIA, and IIIA."

Each laboratory is required to maintain a customized *Procedures Manual* describing use of the equipment, supplies, and materials available in the laboratory. A *Quality Assurance Plan* describing the QA/QC protocols and data acceptance criteria used for compliance monitoring must be maintained. Separate analysis records, supporting QC data, and summaries must be maintained for each Program Area, matrix type, analytical procedure, and process group. A printout of the method file must be maintained to document the instrument set-up and control settings, calibration protocol, auto-sampler report, analytical test sequence, and compliance with the Quality Assurance Protocols.

The Quality Assurance Protocol must include the following items and records:

1) Initial Calibration Verification (ICV)
2) Alternate Source Standard (QC Check)
3) Laboratory Reagent Blanks (LRB)
4) Laboratory Fortified Blanks (LFB)
5) Calibration Blanks (Acid Blanks)
6) Continuing Calibration Verification (CCV)
7) Continuing Calibration Blanks (CCB)
8) Duplicate Sample Determinations (DUPs)
9) Fortified Sample Matrix Analyses (SPKs)
10) Program Area and Matrix Type "QC Summaries"

NOTE: The calibration standards and continuing calibration check standards must be selected to bracket the range of samples being processed. Practical Quantitation Limit (PQL) standards must be analyzed periodically during each run to verify method accuracy and precision at the regulatory threshold. The Continuing Calibration Checks and Method Blanks must be analyzed at the beginning and end of each process group.

The following items must be submitted with the application for trace metal parameters:

1) Procedures Manual
2) Quality Assurance Plan
3) Detection Limit Studies
4) Linear Range Evaluation
5) Performance Audit Test Results

The following records must be maintained with each process group to define the quality of the data:

1) Sample custody records, sample preservation notations, and sample discrepancy, corrective action, and client notification reports.

2) Sample digestion treatment "write-ups", digestion logs, and QC data including: "traceable" method blank ID#, spike blank, sample ID#s and spiking information.

3) Instrument brand/model, "software" version, file name, last update, control screen selections, date/time of analysis, matrix type and technicians initials. The software operational files (containing all information necessary to reconstruct the analysis) must be maintained on file.

4) Primary standards receipt log and standards preparation workbooks complete with a traceable "standard ID# " system.

5) Multi-point calibration entries, alternate source calibration check, continuing calibration checks, and baseline re-checks.

6) Matrix accuracy and precision checks, spike material I.D., data summaries for each Program Area and matrix type.

7) Problem matrix identification criteria, sample screening protocols, problem matrix evaluation procedures (alternate wavelength, matrix matching, alternate modifiers, serial dilution, standard addition).

8) In-house data review, validation, and sign-off protocols.